

Claims

What is claimed is:

1. A stimulation kit, comprising:
a first tissue stimulation lead comprising a first elongated body, a first
5 stimulation element, and a first coupling mechanism longitudinally extending along at
least a portion of the first elongated body; and
a second tissue stimulation lead comprising a second elongated body, a
second stimulation element, and a first complementary coupling mechanism
configured to slidably engage the first coupling mechanism.
- 10 2. The stimulation kit of claim 1, wherein at least one of the first and
second elongated bodies is cylindrically-shaped.
3. The stimulation kit of claim 1, wherein the greatest cross-sectional
dimension of at least one of the first and second elongated bodies is 5 mm or less.
4. The stimulation kit of claim 1, wherein the first and second stimulation
15 elements are electrodes.
5. The stimulation kit of claim 1, wherein the first and second stimulation
elements are mounted on the respective first and second elongated bodies.
6. The stimulation kit of claim 1, wherein the first and second stimulation
elements are configured to face a single direction when the first complementary
20 coupling mechanism slidably engages the first coupling mechanism.
7. The stimulation kit of claim 1, wherein each of the first and second
stimulation leads comprises a plurality of stimulation elements.

8. The stimulation kit of claim 1, wherein the first coupling mechanism and first complementary coupling mechanism are configured to slidably engage each other in a rail and slot arrangement.

9. The stimulation kit of claim 1, wherein the second complementary
5 coupling mechanism extends along only a distal portion of the second elongated body.

10. The stimulation kit of claim 1, wherein the second elongated body is shorter than the first elongated body.

11. The stimulation kit of claim 1, wherein the second elongated body is
10 configured to deploy from the first elongated body by slidably disengaging at least a portion of the complementary coupling mechanism from the coupling mechanism.

12. The stimulation kit of claim 11, wherein the second elongated body is pre-curved.

13. The stimulation kit of claim 11, wherein the second elongated body is
15 configured to be actively changed from a first geometry to a second geometry after deployment from the first elongated body.

14. The stimulation kit of claim 13, further comprising a stylet configured to be introduced through the second elongated body to change the second elongated body from the first geometry to the second geometry.

20 15. The stimulation kit of claim 13, wherein the second stimulation lead comprises a pullwire configured to be pulled to change the second elongated body from the first geometry to the second geometry.

16. The stimulation kit of claim 1, wherein the complementary coupling mechanism does not extend along a portion of the second elongated body, and the

second elongated body is configured to deploy from the first elongated body by bowing the portion of the second elongated body away from the first elongated body.

17. The stimulation kit of claim 1, wherein the second stimulation lead comprises a flap on which the respective stimulation element is disposed, the flap
5 extending along a portion of the complementary coupling mechanism, and configured to be secured by the coupling mechanism when the portion of the complementary coupling mechanism slidably engages the coupling mechanism and released by the coupling mechanism when the portion of the complementary coupling mechanism slidably disengages the coupling mechanism.

10 18. The stimulation kit of claim 1, wherein the first stimulation lead comprises another coupling mechanism longitudinally extending along at least a portion of the first elongated body, the stimulation kit further comprising a third stimulation lead comprising a third elongated body, a stimulation element mounted on the third elongated body, and another complementary coupling mechanism
15 configured to slidably engage the other coupling mechanism.

19. The stimulation kit of claim 1, further comprising a stimulation source configured to be coupled to the first and second stimulation leads.

20. A method of treating a disorder in a patient using the stimulation kit of claim 1, comprising:

20 delivering the first stimulation lead into the epidural space of the patient's spine;

delivering the second stimulation lead into the epidural space by sliding the complementary coupling mechanism along the coupling mechanism.

21. The method of claim 20, wherein the first and second stimulation leads
25 are delivered into the epidural space through a percutaneous opening.

22. The method of claim 20, further comprising conveying stimulation energy from the first and second stimulation elements into neural tissue within the patient's spine.

23. The method of claim 22, wherein the disorder is chronic pain.

5 24. A stimulation kit, comprising:

a primary tissue stimulation lead comprising a primary elongated body, a primary stimulation element mounted on the elongated body, first and second coupling mechanisms longitudinally extending along at least a portion of the elongated body, the first and second coupling mechanisms being substantially opposite each other; and

10 two secondary tissue stimulation leads, each comprising a secondary elongated body, a secondary stimulation element mounted to the secondary elongated body, and a complementary coupling mechanism, wherein the complementary coupling mechanisms are configured to slidably engage the respective first and second coupling mechanisms.

25. The stimulation kit of claim 24, wherein the primary elongated body is cylindrically-shaped.

26. The stimulation kit of claim 24, wherein the primary and secondary stimulation elements are electrodes.

20 27. The stimulation kit of claim 24, wherein the primary and secondary stimulation elements are mounted on the respective elongated bodies.

28. The stimulation kit of claim 24, wherein the primary and secondary stimulation elements are configured to face a single direction when the complementary coupling mechanisms slidably engage the respective first and second coupling mechanisms.

29. The stimulation kit of claim 24, wherein each of the primary and second stimulation leads comprises a plurality of stimulation elements mounted on the respective elongated bodies.

30. The stimulation kit of claim 24, wherein the first and second coupling mechanisms and respective complementary coupling mechanisms are configured to slidably engage each other in a rail and slot arrangement.

31. The stimulation kit of claim 24, wherein complementary coupling mechanisms only extend along distal portions of the respective secondary elongated bodies.

32. The stimulation kit of claim 24, further comprising a stimulation source configured to be coupled to the primary and secondary stimulation leads.

33. A method of treating a disorder in a patient using the stimulation kit of claim 24, comprising:

delivering the primary stimulation lead into the epidural space of the patient's spine;

delivering one of the two stimulation leads into the epidural space by sliding the respective complementary coupling mechanism along the first coupling mechanism; and

delivering the other of the two stimulation leads into the epidural space by sliding the respective complementary coupling mechanism along the second coupling mechanism.

34. The method of claim 33, wherein the primary and secondary stimulation leads are delivered into the epidural space through a percutaneous opening.

35. The method of claim 33, further comprising conveying stimulation energy from the primary and secondary stimulation elements into neural tissue within the patient's spine.

36. The method of claim 33, wherein the disorder is chronic pain.

5 37. A method of treating a disorder in a patient, comprising:
delivering a first stimulation lead into the epidural space of the patient's spine;
delivering a second stimulation lead into the epidural space by slidably
engaging the second stimulation lead along the first stimulation lead.

38. The method of claim 37, wherein the first and second stimulation leads
10 are delivered into the epidural space through a percutaneous opening.

39. The method of claim 37, further comprising implanting the first and second stimulation leads within the patient's spine.

40. The method of claim 37, further comprising coupling the first and second stimulation leads to a stimulation source.

15 41. The method of claim 37, wherein the disorder is chronic pain.

42. The method of claim 40, further comprising conveying stimulation energy from the stimulation source to the first and second stimulation leads to stimulate neural tissue within the patient's spine.

43. The method of claim 42, wherein the stimulation energy is electrical
20 energy.

44. The method of claim 42, wherein the stimulation energy is focused into the neural tissue.

45. The method of claim 37, further comprising delivering a third stimulation lead into the epidural space by slidably engaging the third stimulation
25 lead along the first stimulation lead.

46. The method of claim 37, further comprising inserting a delivery device into the epidural space, wherein the first stimulation lead is introduced through the delivery device into the epidural space.

47. The method of claim 46, wherein the delivery device is one of an
5 introducer or needle.

48. A medical kit, comprising:
a first medical lead comprising a first elongated body, a first operative element, and a first coupling mechanism longitudinally extending along at least a portion of the first elongated body; and

10 a second medical lead comprising a second elongated body, a second operative element, and a first complementary coupling mechanism configured to slidably engage the first coupling mechanism.

49. The medical kit of claim 48, wherein at least one of the first and second elongated bodies is cylindrically-shaped.

15 50. The medical kit of claim 48, wherein the greatest cross-sectional dimension of at least one of the first and second elongated bodies is 5 mm or less.

51. The medical kit of claim 48, wherein the first and second operative elements are electrodes.

52. The medical kit of claim 48, wherein the first and second operative
20 elements are mounted on the respective first and second elongated bodies.

53. The medical kit of claim 48, wherein the first and second operative elements are configured to face a single direction when the first complementary coupling mechanism slidably engages the first coupling mechanism.

54. The medical kit of claim 48, wherein each of the first and second
25 medical leads comprises a plurality of operative elements.

55. The medical kit of claim 48, wherein the first coupling mechanism and first complementary coupling mechanism are configured to slidably engage each other in a rail and slot arrangement.

56. The medical kit of claim 48, wherein the second complementary
5 coupling mechanism extends along only a distal portion of the second elongated body.

57. The medical kit of claim 48, wherein the second elongated body is shorter than the first elongated body.

58. The medical kit of claim 48, wherein the second elongated body is
10 configured to deploy from the first elongated body by slidably disengaging at least a portion of the complementary coupling mechanism from the coupling mechanism.

59. The medical kit of claim 58, wherein the second elongated body is pre-curved.

60. The medical kit of claim 48, wherein the second elongated body is
15 configured to be actively changed from a first geometry to a second geometry after deployment from the first elongated body.

61. The medical kit of claim 60, further comprising a stylet configured to be introduced through the second elongated body to change the second elongated body from the first geometry to the second geometry.

20 62. The medical kit of claim 60, wherein the second medical lead comprises a pullwire configured to be pulled to change the second elongated body from the first geometry to the second geometry.

63. The medical kit of claim 48, wherein the complementary coupling mechanism does not extend along a portion of the second elongated body, and the

second elongated body is configured to deploy from the first elongated body by bowing the portion of the second elongated body away from the first elongated body.

64. The medical kit of claim 48, wherein the second medical lead comprises a flap on which the respective operative element is disposed, the flap
5 extending along a portion of the complementary coupling mechanism, and configured to be secured by the coupling mechanism when the portion of the complementary coupling mechanism slidably engages the coupling mechanism and released by the coupling mechanism when the portion of the complementary coupling mechanism slidably disengages the coupling mechanism.

10 65. The medical kit of claim 48, wherein the first medical lead comprises another coupling mechanism longitudinally extending along at least a portion of the first elongated body, the medical kit further comprising a third medical lead comprising a third elongated body, an operative element mounted on the third elongated body, and another complementary coupling mechanism configured to
15 slidably engage the other coupling mechanism.

66. A method of treating a disorder in a patient using the medical kit of claim 48, comprising:
delivering the first medical lead into the epidural space of the patient's spine;
delivering the second medical lead into the epidural space by sliding the
20 complementary coupling mechanism along the coupling mechanism.

67. The method of claim 66, wherein the first and second medical leads are delivered into the epidural space through a percutaneous opening.

68. The method of claim 66, wherein the disorder is chronic pain.

69. A medical kit, comprising:

a primary tissue medical lead comprising a primary elongated body, a primary operative element mounted on the elongated body, first and second coupling mechanisms longitudinally extending along at least a portion of the elongated body, the first and second coupling mechanisms being substantially opposite each other;

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two secondary tissue medical leads, each comprising a secondary elongated body, a secondary operative element mounted to the secondary elongated body, and a complementary coupling mechanism, wherein the complementary coupling mechanisms are configured to slidably engage the respective first and second coupling mechanisms.

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70. The medical kit of claim 69, wherein the primary elongated body is cylindrically-shaped.

71. The medical kit of claim 69, wherein the primary and secondary operative elements are electrodes.

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72. The medical kit of claim 69, wherein the primary and secondary operative elements are mounted on the respective elongated bodies.

73. The medical kit of claim 69, wherein the primary and secondary operative elements are configured to face a single direction when the complementary coupling mechanisms slidably engage the respective first and second coupling mechanisms.

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74. The medical kit of claim 69, wherein each of the primary and second medical leads comprises a plurality of operative elements mounted on the respective elongated bodies.

75. The medical kit of claim 69, wherein the first and second coupling mechanisms and respective complementary coupling mechanisms are configured to slidably engage each other in a rail and slot arrangement.

76. The medical kit of claim 69, wherein complementary coupling mechanisms only extend along distal portions of the respective secondary elongated bodies.

77. A method of performing a medical procedure on a patient using the medical kit of claim 69, comprising:

delivering the primary medical lead into the epidural space of the patient's spine;

delivering one of the two medical leads into the epidural space by sliding the respective complementary coupling mechanism along the first coupling mechanism; and

delivering the other of the two medical leads into the epidural space by sliding the respective complementary coupling mechanism along the second coupling mechanism.

78. The method of claim 77, wherein the primary and secondary medical leads are delivered into the epidural space through a percutaneous opening.

79. A method of performing a medical procedure on a patient, comprising:
delivering a first medical lead into the epidural space of the patient's spine;
delivering a second medical lead into the epidural space by slidably engaging the second medical lead along the first medical lead.

80. The method of claim 79, wherein the first and second medical leads are delivered into the epidural space through a percutaneous opening.

81. The method of claim 79, further comprising implanting the first and second medical leads within the patient's spine.

82. The method of claim 79, further comprising delivering a third medical lead into the epidural space by slidably engaging the third medical lead along the
5 first medical lead.

83. The method of claim 79, further comprising inserting a delivery device into the epidural space, wherein the first medical lead is introduced through the delivery device into the epidural space.

84. The method of claim 83, wherein the delivery device is one of an
10 introducer or needle.

85. A stimulation kit, comprising:
a guide comprising a first elongated body and a first coupling mechanism longitudinally extending along at least a portion of the first elongated body; and
a tissue stimulation lead comprising a second elongated body, a stimulation
15 element, and a first complementary coupling mechanism configured to slidably engage the first coupling mechanism.

86. The stimulation kit of claim 85, wherein the first elongated body is cylindrically-shaped.

87. The stimulation kit of claim 85, wherein the greatest cross-sectional
20 dimension of the first elongated body is 5 mm or less.

88. The stimulation kit of claim 85, wherein the stimulation element is an electrode.

89. The stimulation kit of claim 85, wherein the stimulation element is mounted on the elongated body.

90. The stimulation kit of claim 85, wherein the stimulation lead comprises a plurality of stimulation elements.

91. The stimulation kit of claim 85, wherein the first coupling mechanism and first complementary coupling mechanism are configured to slidably engage each other in a rail and slot arrangement.

92. The stimulation kit of claim 85, wherein the second complementary coupling mechanism extends along only a distal portion of the second elongated body.

93. The stimulation kit of claim 85, wherein the second elongated body is shorter than the first elongated body.

94. The stimulation kit of claim 85, wherein the second elongated body is configured to deploy from the first elongated body by slidably disengaging at least a portion of the complementary coupling mechanism from the coupling mechanism.

95. The stimulation kit of claim 94, wherein the second elongated body is pre-curved.

96. The stimulation kit of claim 94, wherein the second elongated body is configured to be actively changed from a first geometry to a second geometry after deployment from the first elongated body.

97. The stimulation kit of claim 96, further comprising a stylet configured to be introduced through the second elongated body to change the second elongated body from the first geometry to the second geometry.

98. The stimulation kit of claim 96, wherein the stimulation lead comprises a pullwire configured to be pulled to change the second elongated body from the first geometry to the second geometry.

99. The stimulation kit of claim 85, wherein the complementary coupling mechanism does not extend along a portion of the second elongated body, and the second elongated body is configured to deploy from the first elongated body by bowing the portion of the second elongated body away from the first elongated body.

5 100. The stimulation kit of claim 85, wherein the stimulation lead comprises a flap on which the respective stimulation element is disposed, the flap extending along a portion of the complementary coupling mechanism, and configured to be secured by the coupling mechanism when the portion of the complementary coupling mechanism slidably engages the coupling mechanism and released by the coupling
10 mechanism when the portion of the complementary coupling mechanism slidably disengages the coupling mechanism.

 101. The stimulation kit of claim 85, wherein the guide comprises another coupling mechanism longitudinally extending along at least a portion of the first elongated body, the stimulation kit further comprising another stimulation lead
15 comprising a third elongated body, another stimulation element mounted on the third elongated body, and another complementary coupling mechanism configured to slidably engage the other coupling mechanism.

 102. The stimulation kit of claim 85, further comprising a stimulation source configured to be coupled to the stimulation lead.

20 103. A method of treating a disorder in a patient using the stimulation kit of claim 85, comprising:

 delivering the guide into the epidural space of the patient's spine;

 delivering the stimulation lead into the epidural space by sliding the complementary coupling mechanism along the coupling mechanism.

104. The method of claim 103, wherein the guide and stimulation lead are delivered into the epidural space through a percutaneous opening.

105. The method of claim 103, further comprising conveying stimulation energy from the stimulation element into neural tissue within the patient's spine.

5 106. The method of claim 103, wherein the disorder is chronic pain.

107. A medical kit, comprising:

a guide comprising a first elongated body and a first coupling mechanism longitudinally extending along at least a portion of the first elongated body; and

10 a medical lead comprising a second elongated body, an operative element, and a first complementary coupling mechanism configured to slidably engage the first coupling mechanism.

108. The medical kit of claim 107, wherein the first elongated body is cylindrically-shaped.

109. The medical kit of claim 107, wherein the greatest cross-sectional
15 dimension of the first elongated body is 5 mm or less.

110. The medical kit of claim 107, wherein the operative element is an electrode.

111. The medical kit of claim 107, wherein the operative element is mounted on the elongated body.

20 112. The medical kit of claim 107, wherein the medical lead comprises a plurality of operative elements.

113. The medical kit of claim 107, wherein the first coupling mechanism and first complementary coupling mechanism are configured to slidably engage each other in a rail and slot arrangement.

114. The medical kit of claim 107, wherein the second complementary coupling mechanism extends along only a distal portion of the second elongated body.

115. The medical kit of claim 107, wherein the second elongated body is shorter than the first elongated body.

116. The medical kit of claim 107, wherein the second elongated body is configured to deploy from the first elongated body by slidably disengaging at least a portion of the complementary coupling mechanism from the coupling mechanism.

117. The medical kit of claim 116, wherein the second elongated body is pre-curved.

118. The medical kit of claim 116, wherein the second elongated body is configured to be actively changed from a first geometry to a second geometry after deployment from the first elongated body.

119. The medical kit of claim 118, further comprising a stylet configured to be introduced through the second elongated body to change the second elongated body from the first geometry to the second geometry.

120. The medical kit of claim 118, wherein the medical lead comprises a pullwire configured to be pulled to change the second elongated body from the first geometry to the second geometry.

121. The medical kit of claim 107, wherein the complementary coupling mechanism does not extend along a portion of the second elongated body, and the second elongated body is configured to deploy from the first elongated body by bowing the portion of the second elongated body away from the first elongated body.

122. The medical kit of claim 107, wherein the medical lead comprises a flap on which the respective operative element is disposed, the flap extending along a

portion of the complementary coupling mechanism, and configured to be secured by the coupling mechanism when the portion of the complementary coupling mechanism slidably engages the coupling mechanism and released by the coupling mechanism when the portion of the complementary coupling mechanism slidably
5 disengages the coupling mechanism.

123. The medical kit of claim 107, wherein the guide comprises another coupling mechanism longitudinally extending along at least a portion of the first elongated body, the medical kit further comprising another medical lead comprising a third elongated body, another operative element mounted on the third elongated
10 body, and another complementary coupling mechanism configured to slidably engage the other coupling mechanism.

124. A method of performing a medical procedure on a patient using the medical kit of claim 107, comprising:

delivering the guide into the epidural space of the patient's spine;
15 delivering the medical lead into the epidural space by sliding the complementary coupling mechanism along the coupling mechanism.

125. The method of claim 124, wherein the guide and medical lead are delivered into the epidural space through a percutaneous opening.